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September 30, 2013

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U.S. Environmental Protection Agency, Region 7
Air and Waste Management Division
RCRA Corrective Action & Permits Branch
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Re: Response to KDHE and EPA Comments of July 19, 2013
HHRA Work Plan
MRP Properties Company, LLC – Arkansas City, Kansas
EPA ID No. KSD087418695
VIA FEDERAL EXPRESS TRK#'s: 7968 0390 1085 / 7968 0393 7167

Dear Mr. Kamal and Mr. Roberts:

MRP Properties Company, LLC (MRP) has reviewed the Kansas Department of Health and Environment (KDHE) letter dated July 19, 2013 containing the comments from KDHE and EPA on the human health risk assessment (HHRA) work plan submitted by MRP on January 25, 2013. MRP, KDHE, EPA, and MWH conducted a telephone conference call to review the comments with EPA's risk assessor on September 3, 2013. MRP's response to the KDHE and USEPA comments are provided in this letter. A copy of this letter is included in an Adobe PDF file on the enclosed CD for each agency.

The following presents the KDHE and EPA July 19, 2013 comments (*in italics*) followed by MRP's responses.

General Comment

1. *The Work Plans indicate that the facility plans to collect additional soil samples in some areas for better characterization, as well as to conduct a baseline human health risk assessment according to the EPA's guidance. However, the facility continues to prefer to evaluate exposures to groundwater via ingestion or vapor intrusion separately, which we feel is inappropriate, particularly for current/future industrial/commercial workers with direct soil exposures and exposures via the vapor intrusion pathway. They also continue to plan to divide the facility into multiple areas for assessment. If this approach is to be pursued, we suggest a more meaningful division into areas with distinct exposure patterns.*

   Response:
   As agreed during the September 3rd teleconference between MRP, MHW, KDHE and the USEPA, potential human health risks associated with vapor intrusion (VI) to indoor air will be evaluated for future receptors using current concentrations of volatile organic compounds (VOCs) measured in groundwater based on existing data collected from the Site. Potential VI concerns for current workers will be addressed through the collection of sub-slab soil vapor samples beneath any buildings that overlie VOC-impacted groundwater.

Please note that the exposure units (EUs) for the Process Area (PA) were based on assumed future development of the PA into 5-acre commercial/industrial parcels. Given the expanded scope of the HHRA and specifically the expanded area of the assessment, MRP believes 10-acre commercial/industrial parcels are more representative of future development. Therefore, we intend to address the Site as 10-acre EUs for the revised HHRA Work Plan and Data Gap Characterization Work Plan.

Specific Comments

1. ***Cover.*** *The title of this work plan specifically includes, "for Soils." However, groundwater, sediment, surface water, and indoor air should also be addressed in this work plan, as shown on Figure 4-1, the Conceptual Site Model, and as discussed in this memo. So as to not limit the work plan to soils, which is the correct approach, we suggest deleting "for Soils" from the title.*

   Response:
   As discussed during the September 3rd teleconference, the HHRA will be performed for the entire Site and will include groundwater and soil. A separate HHRA work plan will be submitted at a future date for surface water and sediment using existing data, supplemented with additional data to be collected during the Data Gap Characterization work.

2. ***Sections 1.0 (p. 1-1) and 1.2 (p. 1-4).*** *These sections indicate that the proposed work plan is for 13 exposure units delineated in the process area, junk storage area, and construction debris landfill, using existing data. Based on Figure 2-1, these 13 EUs appear to exclude many areas of potential interest for the site. For example, page 1-4 states, "[t]he remaining portions of the Site, including the former Tank Farm, will be evaluated at a later time." It does not appear that there is a plan to evaluate these other areas for inclusion in the upcoming human health risk assessment. Specifically, page 1-4 appears to indicate that a document separate from the risk assessment would characterize potential human health risks associated with any potential future data collected to address data gaps. As communicated previously via conference call on May 8, 2012, the EPA prefers that MRP collect additional data necessary to address gaps and then conduct a single human health risk assessment for the entire site using the currently available data together with the new data. However, if the facility is to be divided into multiple areas for assessment, we suggest a more meaningful division into areas with distinct exposure patterns. Please see Comment 18 for more details.*

   Response:
   Please refer to our response to Specific Comment No. 1, above.

   Please refer to our response to EPA's General Comment, above, regarding the EU approach.

3. ***Sections 1.0 (p. 1-1) and 1.2 (p. 1-5).*** *While this work plan is for the development of a human health risk assessment, it will also be necessary for MRP to perform a screening level ecological risk assessment. In particular, undeveloped land and ponds are located on site, and the site is in close proximity to the Arkansas and Walnut Rivers, all of which may provide habitats for a variety of ecological receptors. We disagree that "The Site currently contains no significant habitat for wildlife..." A Screening Level Ecological Risk Assessment consists of Steps 1and 2 out of an 8 step process (EPA, 1997). Region 7 ecological risk assessors use the following ecological screening levels:*

Surface water ecological screening levels:
National Ambient Water Quality Criteria (U.S. EPA, 2009).
http://water.epa.gov/scitech/swguidance/standards/criterialcurrent/index.cfm

Kansas Water Quality Standards (KDHE, 2008)
htt p://water.epa.gov/scitech/swguidance/standards/wqslibrary/upload/2008 11 12 standards wqslibrary ks ks-tables.pdf

Region 5 Ecological Screening Levels, (U.S.EPA, 2003)
http://epa.gov/region05/waste/cars/pdfs/ecological-screening-levels-200308.pdf

Sediment probable effect concentration ecological screening levels:
MacDonald DD, Ingersoll CG, Berger T. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch Environ Contam Toxicol 39:20-31.

Region 5 Ecological Screening Levels, (U.S. EPA, 2003).
http://epa.gov/region05/waste/cars/pdfs/ecological-screening-levels-200308.pdf

Soil ecological screening levels:
Ecological Soil Screening Levels.
http://www.epa.gov/ecotox/ecossl/index.html

Response:
Please note that the Site has been operated as an industrial facility since the early 1900's and is currently zoned commercial/ industrial. Planned future use of the Site is limited to commercial/industrial development. The Site is highly disturbed and future enhancement for wildlife use is not planned. In addition, groundwater beneath the facility is intercepted, extracted, treated and discharged to the Walnut River in compliance with a NPDES discharge permit; thus, there is no reason to assume the Site provides a significant habitat for wildlife. Nevertheless, a simple, Screening Level Ecological Risk Assessment (SLERA) will be performed for the Site, as discussed during the September 3rd teleconference and outlined in the revised HHRA Work Plan.

4. ***Section 1.2 (pp. 1-4 and 1-5) and Section 4.1.1 (p. 4-1).*** *These sections indicate that site groundwater will not be addressed in the HHRA, including the drinking water and vapor intrusion pathways. As a reminder, a baseline human health risk assessment requires evaluation of all complete exposure pathways under current and potential future land use scenarios, excluding the presence of engineering controls. Without collection and evaluation of adequate groundwater data, potential human health risks via the drinking water and vapor intrusion pathways are unknown. The risk assessment should be an objective document that portrays potential risks. These risk estimates are then used by risk managers when considering potential remediation options, which may include institutional and other forms of engineering controls, vapor mitigation systems, and/or various cleanup options.*

Response:
Please refer to our responses to EPA's General Comment and Specific Comment No. 1, above, regarding evaluation of groundwater and the potential VI exposure pathway.

5. ***Section 3.1 (p. 3-1).*** *The first paragraph of this section discusses historical data for the site. If such data do not represent current conditions (e.g., the soil samples collected in 1999 prior to removal of underground piping and movement of soil), we agree that it would be appropriate to exclude them from the risk assessment. However, we question whether some of the groundwater, surface water, and sediment data collected in 1990 might not still be representative of current site conditions. Age alone is not sufficient justification to exclude data. We recommend that MRP evaluate whether some of this older data, particularly in areas whether soils have not been disturbed or for other media, might add value to the risk assessment.*

   Response:
   MRP will evaluate whether some of the older data might add value to the risk assessment.

6. ***Section 3.1 (p. 3-1) and Tables 3-1 and 3-2.*** *When reporting summary statistics, the maximum analytical method detection limit was listed, when available, for undetected compounds. Only when the MDL was unavailable was the maximum laboratory reporting limit listed. Although the MDL is the lowest concentration at which an analyte can be detected by a given method, the MRL is the lowest concentration at which an analyte can be quantified by a particular lab with a certain degree of precision and accuracy. Thus, for screening undetected compounds, the maximum MRL should be used, not the MDL.*

   Response:
   The maximum MDL was listed only in cases where a chemical was not detected in any sample, and an MDL was available for all samples.

   Section 6.2.2, Data Reporting Requirements, in the QAPP states that:

   - All target compound non-detections will be reported (at a minimum) as less than the RL, and
   - If the KDHE standard for a specific compound is greater than the RL, the sample result will be reported to the MDL.

   Because analyte concentrations were quantified down to the MDL, it is appropriate to compare the MDL for non-detect results to the applicable screening level. As discussed during the September 3rd teleconference, however, if all sample results for a given chemical and dataset are non-detect and the MDLs are elevated, then MRLs will be used for data screening.

7. ***Section 3.1 (p. 3-1) and Tables 3-1 and 3-2.*** *The last paragraph in Section 3-1 indicates that screening level risk estimates were prepared for individual constituents based on the maximum detected concentration, MDL, or MRL. While we recognize that this may be another preliminary way to put potential risks into perspective, please understand that these "risk estimates" are highly uncertain and contain some inaccuracies. For subsurface soil, different exposure parameters and toxicity values are typically used to assess subchronic exposure scenarios. The EPA has not developed default subsurface soil screening levels because they are highly site-specific. In future risk assessment work plans, we encourage you to refrain from calculating preliminary risk estimates because they are highly uncertain and may be interpreted incorrectly.*

   Response:
   Please note that preliminary risk estimates were included in the HHRA Work Plan for the sole purpose of demonstrating that non-detect results are not likely to pose a significant risk and, therefore, do not pose a significant data gap. As discussed during the September 3rd

teleconference, all references to 'preliminary risk estimates' and 'COPCs' will be removed from the HHRA Work Plan.

We acknowledge that the use of RSLs as screening criteria for subsurface soils is overly protective due to the fact that they are derived using chronic toxicity values. However, RSLs are still valid as a screening tool for subsurface soils. The conservatism in using chronic-based RSLs for screening subsurface soils will be acknowledged in revisions to the HHRA Work Plan.

8. ***Tables 3-1 and 3-2.***

   a. ***Date of screening levels.*** *Be sure to indicate the date of the EPA Regional Screening Level table that was referenced. The next biannual update of the RSL tables is expected in June 2013. The most current version available should be used in the HHRA; however, be aware that the screening levels for some compounds may change if new toxicity values become finalized between RSL table updates.*

   Response:
   Agreed. Screening values will be derived from the latest version of the RSLs, at the time the HHRA is submitted.

   The most current toxicity values will be derived from the hierarchy of toxicity information sources listed in Section 4.3 of the HHRA Work Plan, at the time the HHRA is prepared.

   b. ***Adjust only RSLs based on noncancer health effects.*** *Tables 3-1 and 3-2 use 1/10 the value of both cancer and noncancer RSLs. For constituents where the RSL is based on carcinogenicity, please use the screening value that is listed in the EPA's tables, which represents an excess individual lifetime cancer risk of 1 x 10^{-6}. However, for constituents with an RSL based on noncancer health effects, please continue to make the adjustment so that the screening level represents a hazard quotient of 0.1 to account for additivity, rather than 1.0 as listed in EPA's RSL table.*

   Response:
   Agreed, RSLs for carcinogenic chemicals will not be adjusted, for consistency with the KDHE lifetime cancer risk point of departure of 1 x 10^{-5}.

   c. ***Arsenic.*** *The EPA recently recommended using 60% as the default value for relative oral bioavailability of arsenic in soil (USEPA, 2012). This parameter will be incorporated into the May 2013 RSL tables, resulting in slightly higher soil screening levels. For example, the industrial soil RSL based on a 1 x 10^{-6} excess individual lifetime cancer risk will be 2.4 mg/kg arsenic, and the RSL based on a noncancer hazard quotient of 0.1 will be 38 mg/kg. Please be sure to use the updated RSLs for arsenic in Tables 3-1 and 3-2.*

   Response:
   Agreed; the screening value for arsenic will be adjusted to reflect the updated relative bioavailability (RBA) for the oral exposure route.

   d. ***Chromium.*** *Unless speciation data are available, Region 7 assumes that all total chromium detected is the hexavalent form. Therefore, please use 5.6 mg/kg as the screening level for chromium in Tables 3-1 and 3-2. Because the maximum concentrations in Tables 3-1 and 3-2*

exceed 5.6 mg/kg, chromium is expected to be a chemical of potential concern at this site, and potential risks should be quantified in the risk assessment. However, based on the levels in Tables 3-1 and 3-2, potential variability among the samples, and consideration of the target cancer risk range, we note that these risk estimates may not be unacceptable. (Please also see Comment 10a.)

Response:
Agreed, chromium results will be screened against the Industrial Soil RSL of 5.6 mg/kg for hexavalent chromium in the revised HHRA Work Plan. However, please note that, as described in the Data Gap Characterization Work Plan, hexavalent chromium data will be collected at the Site to confirm that total chromium results represent trivalent chromium and not hexavalent chromium. If the hexavalent sampling results confirm that hexavalent chromium is not present in Site soils, then all chromium results will be screened against the RSL for total chromium in the HHRA Report. In the event that hexavalent chromium is detected in Site soils, then hexavalent chromium detections will be screened against the RSL for hexavalent chromium, and the ratio of hexavalent chromium to total chromium in soil at EUs where hexavalent chromium data was collected will be used to evaluate risks at EUs where hexavalent chromium data was not collected.

e. ***Cyanide.*** *Please use an industrial soil screening level of 14 mg/kg, based on a noncancer hazard quotient of 0.1, instead of 61 mg/kg.*

Response:
Agreed.

f. ***Site-related constituents.*** *Although screening levels are generally used to reduce the list of chemicals of potential concern, please note that Region 7 does not "screen out" site-related constituents. For example, if a given class of compounds is associated with historical or current operations of a site, all of those compounds would be retained as COPCs. If concentrations are of minimal concern, this will be evident in the quantitative risk estimates.*

Response:
Agreed. All Site-related constituents will be retained as COPCs for quantitative evaluation in the HHRA even if their concentrations are below screening levels.

g. ***Total Petroleum Hydrocarbons.*** *In our previous comments, we requested analysis for TPH. Because this facility is a former petroleum refinery, it is expected that TPH contamination is present; however as we discussed with ENSV on 7-8-13 it will be acceptable to forego TPH analysis, in light of the fact that other constituents can be used to assess a corresponding risk.*

Response:
Agreed.

9. ***Section 3.2 (pp. 3-1 – 3-2).*** *The first paragraph of Section 3.2 discusses various aspects of data quality and usability. When evaluating data usability for risk assessment purposes, please follow USEPA (1992).*

Response:
Agreed. USEPA (1992) will be followed when evaluating the quality of data to be used in the risk assessment.

10. ***Section 3.2 (pp. 3-2 – 3-3).*** *These pages draw preliminary conclusions based on Tables 3-1 and 3-2. We note that many of these conclusions may change, based on the comments in this memo. Typically, preliminary screening and risk estimates are not presented in a work plan. In particular, we have very low confidence in risk estimates not derived in accordance with the EPA's risk assessment guidance.*

Response:
Please refer to our response to Specific Comment No. 7, above. Section 3.2 will be revised to clarify that screening-level risk estimates were only presented in the Work Plan to demonstrate that non-detect results are not likely to pose a significant risk in the baseline HHRA and, therefore, do not pose a significant data gap. Actual, quantitative risk estimates will be presented in the HHRA itself.

References to 'preliminary risk estimates' and 'COPC' will be deleted from the HHRA Work Plan as actual COPCs will be identified in the HHRA Report.

a. ***Metals.*** *As discussed previously, chromium should be included as a COPC in soil, based on screening the available data using 5.6 mg/kg as the industrial soil screening level. However, as also discussed above, chromium may not present unacceptable health risks at this site that are greater than the EPA's target cancer risk range or a noncancer hazard quotient of 1.0.*

We support the proposal to collect additional samples and analyze them for hexavalent and total chromium, primarily if risk estimates derived using hexavalent chromium toxicity factors are unacceptable. According to the Data Gap Soil Investigation Work Plan, these additional samples will be collected from locations where total chromium levels were greater than 37 mg/kg. Justification for this criterion is that 37 mg/kg is "the mean ambient soil concentration for chromium in the coterminous United States." Ambient metal concentrations are geographically specific, so 37 mg/kg is not necessarily an accurate background level for this site. However, we support use of this level to focus sampling in areas where there is the greatest potential for high levels of hexavalent chromium. We note that cancer risks to industrial workers at 37 mg/kg hexavalent chromium are at the lower end of the EPA's target cancer risk range (approximately 7×10^{-6}). Thus, areas with unacceptably high concentrations of hexavalent chromium are unlikely to be missed, using a criterion of 37 mg/kg.

We do expect that some hexavalent chromium will be present, possibly at low levels. If the ratio of hexavalent to total chromium is fairly consistent and the samples are representative of a given exposure area or the entire site, it may be possible to apply that ratio when screening and/or deriving risk estimates. If the ratio is consistent across the site, the proposed number and location of new samples for chromium speciation should provide adequate statistical power for decision-making purposes. However, in case this ratio varies, MRP might consider collecting additional samples from areas that have the highest levels of total chromium (e.g., EU 10) in order to have sufficient statistical power.

Response:
Agreed.

b. ***VOCs.*** *The work plan notes the presence of dilution issues and matrix interference that will make it unlikely to obtain lower reporting limits if additional samples are analyzed for several of the VOCs. As discussed above, the reporting limits must be used in the screening process, rather than the detection limits. If the maximum detected concentration or maximum reporting limit for a given constituent exceeds its screening level, the constituent must be retained as a COPC for quantitative assessment. In addition, site-related compounds must be retained as COPCs. This would include petroleum additives historically or currently used or present at this site, possibly including ethylene dibromide, 1,2-dichloroethane, MTBE, and/or others.*

Response:
Please refer to our responses to Specific Comment No. 6 and Specific Comment No. 8f, above.

11. ***Section 3.2 (pp. 3-3 - 3-4).*** *One data gap addressed on these pages and in the data gap work plan is that all samples for 7,12-dimethylbenz(a)anthracene were non-detect, with reporting limits greater than the industrial soil RSL. The data gap work plan proposes to collect additional samples to be analyzed for this particular constituent.*

Although PAHs generally are associated with asphalt sites, we are not aware of a particular concern for 7,12-dimethylbenz(a)anthracene. In fact, this compound is often produced for scientific cancer research, since it is such a strong tumor promoter. We recommend that MRP reconsider whether targeted analysis for this one type of PAH is appropriate, given that it is not necessarily associated with this site and that the reporting limit would have to be extremely low to reach the industrial soil RSL. If MRP has reason to believe this compound is associated with this site, it should be investigated and retained as a COPC; otherwise re-sampling to achieve lower reporting limits is unnecessary.

Instead, we recommend that MRP attempt to best characterize the full suite of PAHs (including naphthalene) throughout the site. Table 2-1 of the data gap work plan appears to include all of the PAHs in the SVOC analysis, with the exception of naphthalene. Although naphthalene is included in the list for VOC analysis, not all of the proposed Phase II samples will be analyzed for VOCs. Reporting limits are often an issue with PAHs, so we suggest trying to obtain as close to 10 samples as possible per exposure unit, with adequate RLs for benzo(a)pyrene.

Response:
We agree that 7,12-dimethylbenz(a)anthracene is not likely to be present at the site due to the nature of the soils contamination. We also agree to include naphthalene at locations where PAHs are sampled.

As discussed during the September 3rd teleconference, we intend to collect a minimum of 8 samples for most analytes at most EUs based on the minimum sample requirement for calculating 95% upper confidence limit on the mean concentrations described in the Pro UCL User's Guide. Any exceptions will be clearly noted in the HHRA Work Plan.

12. ***Section 4.1.1 (p. 4-1).*** *The third paragraph in this section mentioned that cumulative effects screening will be performed by dividing the RSL by 10. As mentioned above, Region 7 uses screening levels based on a 1E-6 excess lifetime cancer risk or a noncancer hazard quotient of 0.1. The upcoming May 2013 RSL tables will include noncancer RSLs based on an HQ of 0.1, in addition to an HQ of 1.*

    Response:
    Agreed, RSLs for carcinogenic chemicals will not be adjusted, for consistency with the KDHE lifetime cancer risk point of departure of 1×10^{-5}.

13. ***Section 4.1.1 (pp. 4-1 – 4-2 and Table 4-1.*** *When screening for COPCs, please retain all constituents in which the maximum detected concentration or reporting limit (not detection limit) exceeds the screening level for quantitative assessment. In addition, please retain all site-related constituents that are known to have been used or present historically or currently at the site. This may include TPH, benzene, toluene, ethylbenzene, xylenes, PAHs including naphthalene, some metals, and petroleum additives such as ethylene dibromide, 1,2-dichloroethane, and/or MTBE. Comparison to site-specific background levels should be done as part of the risk characterization process, not as a screening step (USEPA, 2002a; USEPA, 2002b).*

    Response:
    Please refer to our responses to Specific Comments No. 6 and 8f, above, regarding COPC screening.

    We agree to carry all metals with concentrations in excess of RSLs into the quantitative HHRA, even if they are below background concentrations. However, to account for ambient conditions and risks, we will calculate total risks including background concentrations, as well as incremental risks above background.

14. ***Sections 4.1.2.2 and 4.1.2.3 (pp. 4-2 - 4-4) and Figure 4-1.*** *These sections describe potential receptors and potentially complete exposure pathways, and this figure presents the conceptual site model. Sections 4.1.2.2 and 4.1.2.3 and Figure 4-1 indicate that exposure to groundwater will not be evaluated because potable wells will be prohibited and because the current groundwater treatment system is decreasing contaminant concentrations. The National Contingency Plan Preamble (55 FR 8710-8711) states, "The role of the baseline risk assessment is to address the risk associated with a site in the absence of any remedial action or control, including institutional controls." A quantitative risk assessment that evaluates potential exposures to groundwater is necessary to make appropriate risk management decisions, which may include institutional controls restricting use of groundwater at this site. The Preamble also reminds us that, "...It is EPA policy to consider the beneficial use of the water and to protect against current and future exposures. Groundwater is a valuable resource and should be protected and restored if necessary and practicable. Groundwater that is not currently used may be a drinking water supply in the future." The drinking water pathway must be evaluated in the baseline risk assessment for current and potential future receptors, despite potential future administrative controls prohibiting the use of groundwater as a source of drinking water. Potential vapor intrusion from groundwater must also be evaluated, particularly in existing buildings.*

    Response:
    Please refer to our responses to EPA's General Comment and Specific Comment No. 1, above,

regarding groundwater.

15. Section 4.1.2.3 (pp. 4-3 – 4-4), Figure 4-1, and Section 4.2.1 (p. 4-5).

a. ***Current industrial/commercial workers.*** *Figure 4-1 indicates that exposure to soil by current industrial/commercial workers is "Potentially Complete but Insignificant Pathway." We believe the intent is to evaluate risks to future commercial/industrial workers, using more conservative exposure parameters than would be used to assess current workers. If this is the case, risk estimates for future workers would be protective of the less exposed current workers. For current workers, we recommend changing, "Potentially Complete but Insignificant Pathway" to, "Complete Exposure Pathway". Then, in the footnotes of Figure 4-1 and in Section 4.1.2.3, please add a statement that the current commercial/industrial worker scenario will not be evaluated in the risk assessment even though it is a complete pathway, because evaluation of future commercial/industrial workers will be protective of current workers.*

Response:
Agreed. Please note that the use of "insignificant" to describe current exposure pathways was intended to indicate that current workers are likely to have lower exposures than future workers, and not intended to imply that current receptors would not warrant evaluation if future pathways were not also being evaluated.

b. ***Future industrial/commercial workers.*** *Section 4.1.2.3 and Figure 4-1 indicate that exposure to soil via incidental ingestion, dermal contact, and inhalation of soil-derived dust and volatiles are complete exposure pathways for future workers. Please note that we assume industrial/commercial workers are only exposed to surface soil, not subsurface soil. We suggest including surface soil and subsurface soil as two separate "exposure media" in Figure 4-1.*

As previously mentioned, please evaluate worker exposure to groundwater through the direct ingestion pathway and the vapor intrusion pathway. For ingestion, we typically assume a 1 L/day rate for industrial/commercial workers (USEPA, 1991). We do not generally evaluate commercial/industrial exposure to groundwater via dermal contact or inhalation resulting from household use (i.e., showering, bathing, washing hands, etc.) because these are insignificant pathways. We do, however, require evaluation of the vapor intrusion pathway. This will involve use of shallow groundwater data, along with a default or site-specific attenuation factors. In existing buildings, subslab soil gas and/or indoor air samples may be required.

We note the presence of surface water (e.g., oxidation ponds and no. 3B pond). Exposure to surface water (and sediment, if present) by future industrial/commercial workers is a potentially complete exposure pathway that should be considered in the HHRA.

Response:
Regarding soil exposures, surface and subsurface soil will be shown separately in Figure 4-1, and industrial/commercial worker exposures will be evaluated for surface soil only.

Please refer to our responses to EPA's General Comment and Specific Comment No. 1, above, regarding groundwater.

The HHRA WP will be revised to address potential human exposures to applicable surface water features in a separate HHRA as described in the response to specific comment 1.

c. ***Future utility/construction workers.*** *Section 4.1.2.3 and Figure 4-1 correctly indicate that these receptors are exposed to surface and subsurface soil via incidental ingestion, dermal contact, and inhalation of volatiles and particulates. Exposures to groundwater via the direct ingestion and vapor intrusion pathways are incomplete for utility/construction workers. However, the HHRA should evaluate inhalation of volatiles from groundwater in a trench. In addition, if groundwater is present at around 10 ft bgs or less, taking into consideration temporal and seasonal variability, the HHRA must evaluate direct contact by construction workers with groundwater via incidental ingestion and dermal contact. Finally, if it is possible that future construction workers could be exposed to surface water/sediment on-site, this pathway should be evaluated in the HHRA.*

Response:
Agreed. Potential direct ingestion, dermal contact, and inhalation of VOCs in ambient air pathways will be evaluated for utility/construction workers at locations where groundwater is at or shallower than 10 feet bgs.

d. ***Current/future off-site recreational users.*** *Figure 4-1 indicates that exposure to soil by current recreational users is potentially complete but insignificant, and that exposure to surface water, sediment, groundwater, and indoor air is an incomplete pathway. We agree that exposures to indoor air and groundwater by recreational users are incomplete pathways. However, data should be used to show that exposure to soil, sediment, and surface water by recreational users are insignificant or incomplete. More specifically, adequate data should be available to delineate the horizontal (and vertical) extent of contamination. As long as these data show that contamination is confined to the site, exposure to off-site recreational users is not expected.*

Response:
Agreed, on-Site trespassers will be added to the CSM figure and qualitatively evaluated in the HHRA. As noted in our responses to EPA General Comment and Specific Comment No. 1, above, groundwater beneath the facility is intercepted, extracted, treated and discharged to the Walnut River in compliance with a NPDES discharge permit. Hence, there is no reason to assume that off-Site impacts have occurred or that off-site recreational receptors are exposed to significant concentrations of Site contaminants.

e. ***Current/future on-site trespassers.*** *Trespassers were not considered in Section 4.1.2.3, Figure 4-1, or Section 4.2.1. Exposure to on-site surface soil, sediment, and surface water is a complete pathway for trespassers. However, exposure to surface soil by commercial/industrial workers should be protective of trespassers.*

Response:
Agreed. Although frequent trespassing at the Site is not expected, a trespasser will be added to the receptors to be evaluated in the qualitative exposure analysis.

f. ***Future residents.*** *For completeness, we suggest indicating that exposures to future residents are unexpected on-site, based on current zoning, proximity to rivers, location in a flood plain, etc.*

Response:
Agreed. Additional text will be added to describe why future residential land use is unlikely.

16. ***Section 4.2 (pp. 4-4 and 4-5).*** *Section 4.2 lists several USEPA guidance documents that will be used to develop the risk assessment. Please also list and use RAGS Part D (USEPA, 2001). The RAGS Part D tables are a standard component of a baseline HHRA.*

Response:
Agreed. Tables within the HHRA Report will contain the information specified in RAGS D.

17. ***Section 4.2 (p. 4-5).*** *Section 4.2 indicates that the HHRA will consist of an exposure assessment, exposure quantification, toxicity assessment, and risk characterization. Although these are most of the important components of a baseline risk assessment, data evaluation and identification of chemicals of potential concern were not listed. Please include these sections in this HHRA. In addition, we suggest referring to Exhibits 9-1 and 9-2 of RAGS Part A (USEPA, 1989), which contain a suggested outline for baseline HHRAs and a checklist for reviewers.*

Response:
Please note that data evaluation and COPC selection were described in Sections 3.2 and 4.1.1, respectively, of the HHRA Work Plan. Section 4.2 describes the quantitative portions of the HHRA for chemicals of potential concern (COPCs) that will be identified following the methods described in Section 4.1.

18. ***Section 4.2.2 (p. 4-5).*** *This section mentions that the 13 exposure areas will consist of the Junk Storage Area, Construction Debris Landfill, and five acre exposure units in the Process Area. As we mentioned above, please define additional exposure units to assess risks over the entire site. The areas planned for inclusion in the HHRA and those not yet considered are intermingled. For example, the Junk Storage Area is located within the Tank Farm Area. Risks to receptors in these areas are likely similar, and exposures may even occur across adjacent areas. Thus, the division of the site as it is currently planned does not seem logical. Division into multiple risk assessments might be possible, if it could be demonstrated that exposures and risks for the different areas were truly expected to be different.*

Response:
Please see our responses to EPA's General Comment and Specific Comments No. 1 and 2, above.

19. ***Section 4.2.2.1 (p. 4-6).*** *This section describes how exposure point concentrations will be calculated. In general, the section correctly identifies that 95% upper confidence limits on the mean concentration are used as EPCs. However, please be aware that if risks from exposure to lead are assessed, we use a central tendency estimate (i.e., the mean concentration). In addition, Section 4.2.2.1 indicates that if insufficient data are available to calculate a 95% UCL or if the 95% UCL exceeds the maximum detected concentration, then the maximum detected concentration will be used as the EPC. Please note that both of these situations indicate that more data is needed because the number of samples is limited and/or the variability in concentrations is quite large. If possible, we recommend that MRP collect additional samples for*

any media in any exposure units where there are less than around 10 samples. If sufficient data are available to calculate a 95% UCL which exceeds the maximum detected concentration, this 95% UCL should be used as the EPC.

Response:
Please note that we intend to use the 95% upper confidence limit (UCL) on the mean concentration value that is recommended by ProUCL for COPCs other than lead. Central tendency exposure (CTE) estimates will be used to quantitatively evaluate exposures to lead. Text in Section 4.2.2.1 of the HHRA Work Plan will be revised accordingly.

Please note that we're proposing to collect a minimum of 8 samples for most analytes at most EUs based on the minimum sample requirement for calculating 95% upper confidence limit on the mean concentrations described in the Pro UCL User's Guide.

In regard to the use of 95% UCL on the mean concentrations, vs. maximum concentrations, to evaluate lead exposures and risks, 95% UCL on the mean concentrations will be used in preference to maximum concentrations.

20. ***Section 4.2.2.2 (p. 4-6).*** *When calculating oral intake of arsenic in soil, the EPA now recommends using a relative bioavailability of 60% (USEPA, 2012). The RBA for all other compounds (besides arsenic and lead) remains 100%. Please note that this value is only applied to the oral pathway, and only for intake of soil (not water or air).*

Response:
Agreed. The oral dose for arsenic will be adjusted to reflect the EPA's updated RBA for oral exposures to arsenic.

21. ***Section 4.2.2.2 (pp. 4-6 and 4-7).*** *This section lists the intake equations. In the numerator of the inhalation equations, please be sure to include the conversion factor of 24 hours/day. In addition, either a Volatilization Factor or a Particulate Emission Factor should be used in the inhalation intake equations, depending on the volatility of the particular chemical, not both.*

Response:
Agreed. A 24 hours per day conversion factor will be added the inhalation equation.

Please note that both VF and PEF are listed in the inhalation dose equation (as VF + PEF), however, depending on the chemical, one of these values will be defined as equal to zero. In addition, the "+" will be replaced with "or".

22. ***Table 4.2.*** *This table provides the exposure parameters that will be used for the commercial/industrial and utility/construction scenarios.*

    a. *The parameters for commercial/industrial workers are for outdoor workers. Please also include indoor workers because we do not assess the vapor intrusion pathway for outdoor workers. The soil ingestion rate and exposure frequency are slightly different for indoor workers, compared to outdoor industrial/commercial workers.*

    Response:
    Agreed. Exposure assumptions for a future indoor worker will be provided in Table 4.2.

b. *We were unable to verify the values of PEF for the commercial/industrial workers and the utility/construction workers. The input parameters used to calculate site-specific PEF values were not provided. Please note that the site-specific commercial/industrial PEF is only dependent upon the size of the contaminated area and the geographic location. The subchronic PEF includes a dispersion correction factor. Please consult both Section 5.0 and Appendix E of the Supplemental Soil Screening Guidance (USEPA, 2002c) when calculating this PEF.*

Response:
Please note that the PEF was based on region-specific modeling parameters for Lincoln, Nebraska from USEPA (2002). A spreadsheet including the PEF calculation will be provided in the revised version of the HHRA Work Plan.

c. *A non-cancer averaging time of 365 days was used for the utility/construction worker scenario, but the selected exposure frequency was 50 days/year. The non-cancer averaging time should represent the entire duration of the construction project. For example, if the 50 days/year exposure frequency represents 5-day work weeks, 50/5 is 10 weeks, and 10 weeks * 7 days/week is 70 days. In this example, 70 days should be used as the non-cancer averaging time. MRP may determine that year long construction projects are more likely; however, in this case, a larger exposure frequency should be used.*

Response:
Agreed. All non-cancer averaging times will match the total exposure duration for each human receptor that is quantitatively evaluated in the HHRA.

23. ***Section 4.3 (pp. 4-7 and 4-8) and Table 4-3.*** *Section 4.3 lists the sources for toxicity values, and Table 4-3 lists the toxicity values to be used in the HHRA. Please note that toxicity values should be selected according to the hierarchy specified in USEPA (2003). In general, the EPA's RSL tables are a reliable source of the appropriate chronic toxicity values. However, because the RSL tables are only updated biannually, there have been cases in which a new toxicity value has become available, but has not yet included in the tables. For example, new toxicity values for 1,4-dioxane are currently under review by the EPA's IRIS program. Of the toxicity values listed in Table 4-3, the cancer slope factor for chloroform should be 3.1E-02 (mg/kg-day)$^{-1}$, not 1E-02 (mg/kg-day)$^{-1}$.*

Please note that subchronic toxicity values should be used, when available, to evaluate the subchronic utility/construction worker scenario. The Provisional Peer Reviewed Toxicity Values contain some subchronic toxicity values, and ATSDR publishes intermediate-term minimal risk levels for some compounds.

Response:
Please note that all toxicity values to be used in the quantitative HHRA for the Site will be selected according to the hierarchy of toxicity information sources listed in Section 4.3 and the most recently published versions of these toxicity information sources.

Regarding the cancer slope factor for chloroform, the value of 3.1E-02 (mg/kg-day)-1 will be used in the HHRA.

Due to a lack of availability of peer-reviewed and agency-approved sub-chronic toxicity values for many chemicals, we intend to use chronic toxicity values for evaluating both surface and subsurface exposures. Risk estimates calculated for subsurface soils in this manner will be protective of potential shorter-term worker exposures to subsurface soils. Potential uncertainties in this approach will be described in the Uncertainty Analysis section of the HHRA Report.

24. ***Section 4.3.1.2 (p. 4-8).*** *This section indicates that the Adult Lead Methodology will be used to assess potential risks from exposure to lead by industrial/commercial and utility/construction workers. We were unable to review the exposure parameters planned for use in the ALM because they were not provided in the work plan. Please remember that CTE values are typically used for many of the exposure parameters, as opposed to the RME values used to assess risks from chemicals other than lead.*

Response:
Comment noted. As described in the HHRA Work Plan, the USEPA's Adult Lead Model, and the default exposure parameters listed therein (which are based primarily on CTE estimates), will be used to evaluate potential lead exposures.

25. ***Background Arsenic Samples.*** *Figure 2-11 of the Data Gap Soil Investigation Work Plan shows the proposed locations for eight background arsenic samples. From each location, a surface (0 – 2 ft bgs), medium (2 – 4 ft bgs), and deep (4 – 10 ft bgs) sample will be collected, for a total of 24 samples. The samples will be collected from an area immediately southeast of the property boundary.*

We note that the highest concentration of arsenic detected in any one sample was 75 mg/kg, in a surface soil sample collected from EU 7. This concentration falls within the EPA's target cancer risk range and is less than a noncancer hazard quotient of 1.0. Although arsenic would be retained as a COPC during the screening process, it is not likely that arsenic will result in unacceptable risk estimates. A background study may be beneficial depending on the results of the risk assessment, but it is not recommended at this time.

If MRP still chooses to conduct a background arsenic study, please describe why the area is suitable as a background location. This might include geography, types of soil, nearby sources of arsenic contamination, wind speed and direction, land contours, surface water drainage patterns, etc. In particular, because the proposed background area is located so close to the site, is there evidence that it has not been contaminated? Generally, a minimum of 10 samples is necessary for adequate statistical power. It is unclear whether MRP intends to calculate surface, mid-depth, and deep background arsenic concentrations, for which there are eight samples each. Alternatively, MRP may intend to combine all 24 samples into one dataset. A Background Threshold Value or Values should be calculated using the default in ProUCL; that is, the 95% confidence on the 90th percentile. Any apparent outliers should be subjected to ProUCL's statistical outlier test. The resulting ProUCL output files or sheets should be included if the BTVs are referenced or used to make decisions.

Response:
Comment noted. As discussed during the September 3rd teleconference, background samples collected from the shallow depth (0-2 ft bgs) will be used to characterize background for surface soils, while background samples collected from the medium depth (2-4 ft bgs) and deep depth (4-

10 ft bgs) will be combined to characterize background for subsurface soils. ProUCL will be used to derive background threshold values (BTVs) and an outlier test will be performed.

If you have any questions or comments regarding the response to the groundwater SAP comments, please contact me at 210/345-4619 or Jay Mednick, MWH at 303/291-2262.

Sincerely,

Brenda B. Epperson

Enclosure: CD

cc: Mark Vishnefske, KDHE BWM w/o enc.
Kent Biggerstaff – MRP Properties Company, LLC
Jay Mednick – MWH w/o enc.
Bruce Narloch – MWH w/o enc.